

What is claimed is:

1. A semiconductor device comprising:

a semiconductor substrate having a first main surface having circuit  
5 elements formed thereon, a second main surface substantially opposite to the first  
main surface, and a plurality of side faces provided between the first main surface  
and the second main surface; and a plurality of external terminals formed over the  
first main surface and respectively electrically connected to the circuit elements,  
wherein the second main surface has a first steplike section which  
10 extends from a first side face of the plurality of side faces to a second side face  
opposite to the first side face.

2. The semiconductor device according to claim 1, wherein the first  
steplike section is formed in the neighborhood of a third side face of the plurality of  
15 side faces, which is adjacent to the first and second side faces.

3. The semiconductor device according to claim 2, wherein the first  
steplike section has a cross-section formed in a substantially V shape.

20 4. The semiconductor device according to claim 2, wherein the first  
steplike section has a cross-section formed in a substantially U shape.

5. The semiconductor device according to claim 1, wherein the first  
steplike section is formed along the third side face of the plurality of side faces,  
25 which is adjacent to the first and second side faces.

6. The semiconductor device according to claim 5, wherein the thickness of

the semiconductor substrate with the first steplike section formed therein becomes thin as the thickness thereof approaches the outer edge of the semiconductor device.

5           7. The semiconductor device according to claim 1, wherein the second main surface has a second steplike section which extends from the third side face to a fourth side face of the plurality of side faces, which is opposite to the third side face.

10           8. The semiconductor device according to claim 1, wherein the external terminals comprise a plurality of external terminal groups disposed in plural rows, and the first steplike section is formed in the second main surface corresponding to a predetermined row of the plural rows.

15           9. The semiconductor device according to claims 1, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

            10. The semiconductor device according to claims 2, wherein a sealing  
20 resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

            11. The semiconductor device according to claims 9, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed  
25 from the surface of the sealing resin.

            12. The semiconductor device according to claims 4, wherein a sealing

resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

13. The semiconductor device according to claims 1, wherein a sealing  
5 resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

14. The semiconductor device according to claims 6, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed  
10 from the surface of the sealing resin.

15 15. The semiconductor device according to claims 7, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

16. The semiconductor device according to claims 8, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

20 17 A semiconductor device comprising:  
a semiconductor substrate having a first main surface having circuit elements formed thereon, a second main surface substantially opposite to the first main surface, and a plurality of side faces provided between the first main surface and the second main surface; and a plurality of external terminals formed over the  
25 first main surface and respectively electrically connected to the circuit elements,  
wherein the semiconductor substrate has a first portion in which the distance from the first main surface to the second main surface is a first distance,

and a second portion in which the distance from the first main surface to the second main surface is a second distance shorter than the first distance between a first side face of the plurality of side faces and a second side face opposite to the first side face.

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18 The semiconductor device according to claim 17 wherein the second portion is formed in the neighborhood of a third side face of the plurality of side faces, which is adjacent to the first and second side faces.

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19 The semiconductor device according to claim 18 wherein the second portion has a cross-section formed in a substantially V shape.

20. The semiconductor device according to claim 18 wherein the second portion has a cross-section formed in a substantially U shape.

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21. The semiconductor device according to claim 17, wherein the second portion is formed along the third side face of the plurality of side faces, which is adjacent to the first and second side faces.

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22. The semiconductor device according to claim 21, wherein the thickness of the semiconductor substrate with the second portion formed therein becomes thin as the thickness thereof approaches the outer edge of the semiconductor device.

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23. The semiconductor device according to claim 17, wherein the semiconductor substrate further includes a third portion in which the distance from the first main surface to the second main surface is the second distance

between the third side face and a fourth side face of the plurality of side faces,  
which is opposite to the third side face.

24. The semiconductor device according to claim 17, wherein the external  
5 terminals comprise a plurality of external terminal groups disposed in plural rows,  
and the first portion is formed so as to correspond to a predetermined row of the  
plural rows.

25. The semiconductor device according to claim 17, wherein an sealing  
10 resin is formed on the first main surface, and the external terminals are exposed  
from the surface of the sealing resin.

26. The semiconductor device according to claim 18, wherein an sealing  
resin is formed on the first main surface, and the external terminals are exposed  
15 from the surface of the sealing resin.

27. The semiconductor device according to claim 19, wherein an sealing  
resin is formed on the first main surface, and the external terminals are exposed  
from the surface of the sealing resin.

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28. The semiconductor device according to claim 18, wherein an sealing  
resin is formed on the first main surface, and the external terminals are exposed  
from the surface of the sealing resin.

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29. The semiconductor device according to claim 22, wherein an sealing  
resin is formed on the first main surface, and the external terminals are exposed  
from the surface of the sealing resin.

30. The semiconductor device according to claim 23, wherein an sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

5           31. The semiconductor device according to claim 24, wherein an sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

          32. A semiconductor device comprising:  
10           a semiconductor substrate having a first main surface having circuit elements formed thereon, a second main surface substantially opposite to the first main surface, and a plurality of side faces provided between the first main surface and the second main surface; and a plurality of external terminals formed over the first main surface and respectively electrically connected to the circuit elements,  
15           wherein a steplike section extending from a first side face of the plurality of side faces to a second side face opposite to the first side face is formed in the second main surface, and the thickness of the semiconductor substrate is a first thickness at the second main surface excluding the steplike section and is a second thickness thinner than the first thickness at the steplike section.

20           33. The semiconductor device according to claim 32, wherein the steplike section is formed in the neighborhood of a third side face of the plurality of side faces, which is adjacent to the first and second side faces.

25           34. The semiconductor device according to claim 32, wherein the steplike section is formed along the third side face of the plurality of side faces, which is adjacent to the first and second side faces.

35. The semiconductor device according to claim 34, wherein the thickness of the semiconductor substrate at the steplike section becomes thin as the thickness thereof approaches the outer edge of the semiconductor device.

5           36. The semiconductor device according to claim 32, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

          37. The semiconductor device according to claim 33, wherein a sealing  
10 resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

          38. The semiconductor device according to claim 34, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed  
15 from the surface of the sealing resin.

          39. The semiconductor device according to claim 35, wherein a sealing  
resin is formed on the first main surface, and the external terminals are exposed  
from the surface of the sealing resin.

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40. A semiconductor device comprising:

a semiconductor substrate having a first main surface having circuit elements formed thereon, a second main surface substantially opposite to the first main surface, and a plurality of side faces provided between the first main surface  
25 and the second main surface; and a plurality of external terminals formed over the first main surface and respectively electrically connected to the circuit elements,  
wherein the second main surface has a first portion which extends from a

first side face of the plurality of side faces to a second side face opposite to the first side face and whose roughness is coarser than that of the second main surface excluding the first portion.

5           41. The semiconductor device according to claim 40, wherein the first portion is formed in the neighborhood of a third side face of the plurality of side faces, which is adjacent to the first and second side faces.

          42. The semiconductor device according to claim 41, wherein the first  
10   portion has a cross-section formed in a substantially V shape.

          43. The semiconductor device according to claim 41, wherein the first portion has a cross-section formed in a substantially U shape.

15           44. The semiconductor device according to claim 40, wherein the first portion is formed along the third side face of the plurality of side faces, which is adjacent to the first and second side faces.

          45. The semiconductor device according to claim 44, wherein the  
20   thickness of the semiconductor substrate with the first portion formed therein becomes thin as the thickness thereof approaches the outer edge of the semiconductor device.

          46. The semiconductor device according to claim 40, wherein the second  
25   main surface has a second portion which extends from the third side face to a fourth side face opposite to the third side face, of the plurality of side faces and whose roughness is coarser than that of the second main surface excluding the



first and second portions.

47. The semiconductor device according to claim 40, wherein the external terminals comprise a plurality of external terminal groups disposed in plural rows, and the first portion is formed in the second main surface corresponding to a predetermined row of the plural rows.

48. The semiconductor device according to claim 32, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

49. The semiconductor device according to claim 41, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

50. The semiconductor device according to claim 42, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

51. The semiconductor device according to claim 43, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

52. The semiconductor device according to claim 44, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

53. The semiconductor device according to claim 45, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

5           54. The semiconductor device according to claim 46, wherein a sealing resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

          55. The semiconductor device according to claim 47, wherein a sealing  
10 resin is formed on the first main surface, and the external terminals are exposed from the surface of the sealing resin.

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